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the Atom

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In this Issue

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FRONT COVER

Bill Jack Rodgers got close to the subject for this picture of Jim Courtney, SD-4, at the LASL metrology laboratory's proving ring, which utilizes a hydraulic press to measure force. More of Bill Jack's photos are in the articles on the metrology laboratory and LASL deer studies.

The Aim Is Accuracy

The carpenter's rule, the tire pressure gauge, the kitchen measuring cup, and that thermometer mounted outside your living room are crude instruments. They serve their purpose, of course, but extremely accurate they are not.

Los Alamos Scientific Laboratory's metrology laboratory is.

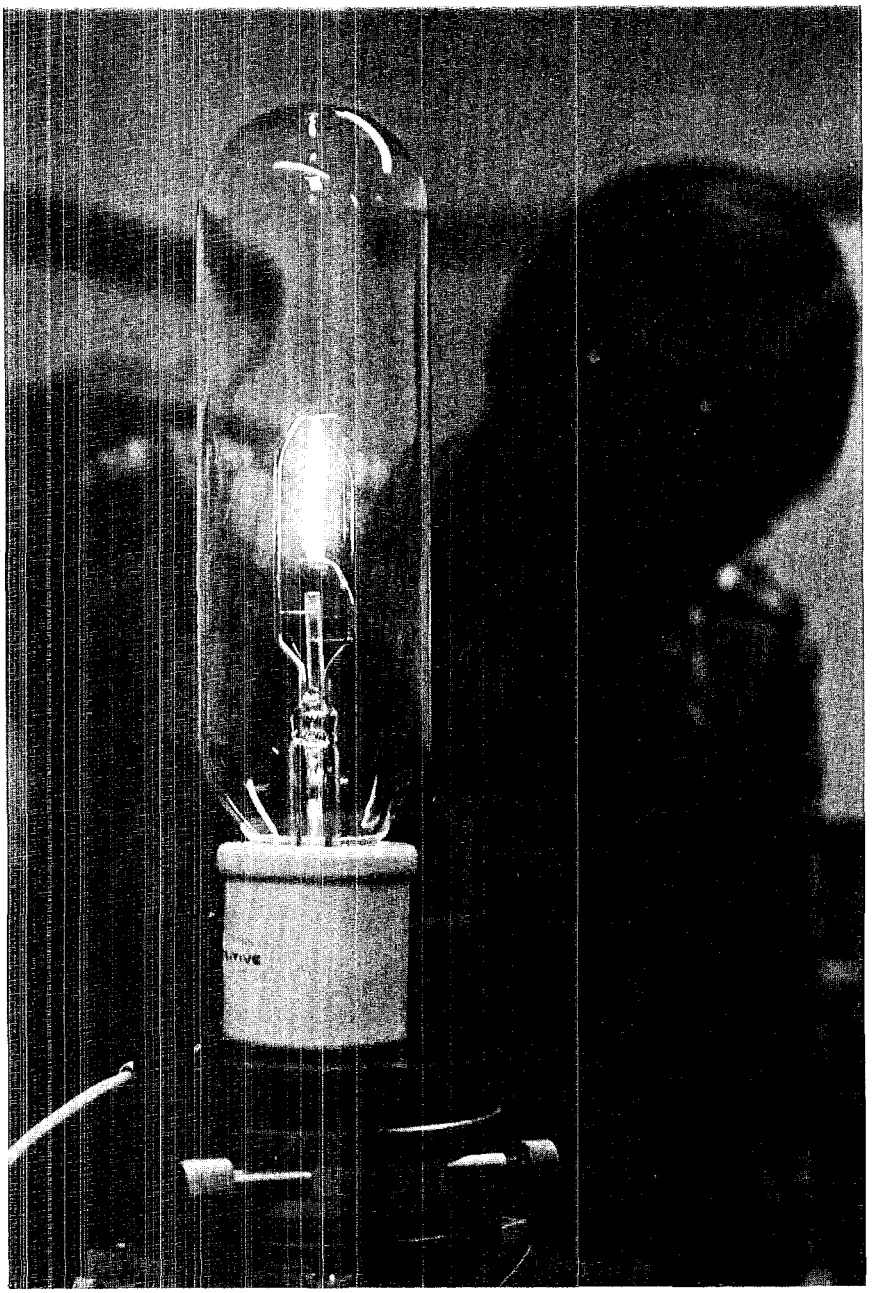
A new facility, the metrology laboratory is being brought into full operation as a first-order measurement and calibration laboratory under the technical direction of the quality assurance, metrology and inspection group (SD-4), and uses personnel from SD-4 and the maintenance and standards group (E-1).

The metrology laboratory is built on the efforts of the existing E-1 (formerly P-1) electrical standards section and the SD-4 dimensional standards section.

Space was set aside in SD-4's existing temperature-controlled areas of the main Shop Building. The physical metrology area has about 185 square meters (1,990 square feet), and the electrical metrology area about 110 square meters (1,200 square feet). The temperature in the physical area is held to 20 degrees Celsius (68 degrees Fahrenheit), and in the electrical area to 23 degrees Celsius (73.4 degrees Fahrenheit). Other environmental factors such as humidity and pressure are not controlled but are continuously monitored to allow corrections.

Metrology is defined as the science of weights and measures, and the metrology laboratory's purpose is to make available to all areas of LASL a state-of-the-art measurement program on a service basis. Although many LASL groups have maintained specific measurement capabilities in support of their own program needs, the metrology laboratory is an effort to develop in one area a coordinated measurement facility.

The metrology laboratory has



Allen Gauler, SD-4, observes a tungsten strip lamp as it begins to glow. The calibrated lamp is used to determine the accuracy of temperature-measuring instruments such as the optical pyrometer.

many responsibilities, according to SD-4 Group Leader Elbert Colston. The laboratory maintains primary standards in order to establish accuracy of measurement devices and to develop historical data to enable prediction in measurement tasks.

Another important responsibility is establishing traceability to the National Bureau of Standards (NBS) for many of the measurement devices and standards maintained at LASL. This traceability is necessary for absolute measurements, and it provides the common standard for interchangeability on a legal basis. Traceability also is required for certain government procurement and research programs.

The metrology laboratory assists other laboratories and groups at LASL in maintaining secondary standards, standards that are declared accurate after being compared to LASL first-order calibrated equipment used by lower echelon laboratories, and provides routine calibration procedures.

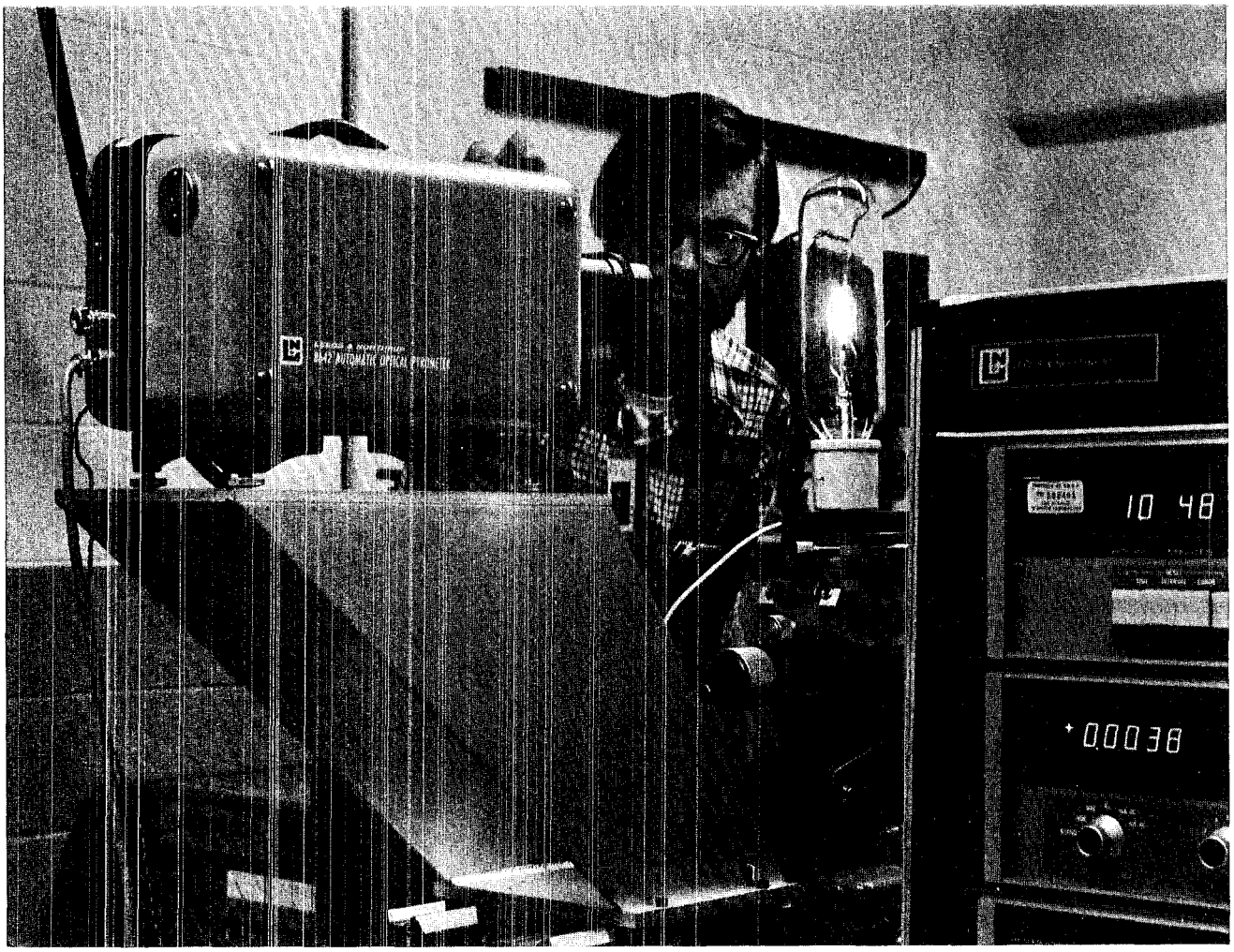
In another area of capability, the metrology laboratory aids in validating research data by verifying accuracy of experimental equipment, and by exchanging data with other facilities based on common standards.

Consulting services are a part of the metrology laboratory's operation, as it assists technical groups in developing economical measurement capability, provides recommendations on various types of equipment, and assists in procurement of appropriate measurement apparatus.

Calibration is a continuing responsibility of the metrology laboratory. Provided are actual values that will be obtained with specific measuring devices. The laboratory also maintains documentation and historical data on user measurement equipment and has established a recall system to continue periodic checks of this equipment.

And, a final major area of re-

Gauler uses the tungsten strip lamp to sight-in an automatic optical pyrometer.



sponsibility is measurement research and development. The laboratory engages in advanced state-of-the-art measurement applications and assists in development of criteria for measurement systems or equipment.

Much new equipment has been bought for the metrology laboratory, with costs spread out over 2 years. The first year's effort has been concentrated on the physical metrology section, and the second year's work is concentrating on the electrical section.

The goal has been to establish the highest quality measurement capability in the areas of basic quantities consistent with budget and manpower considerations, emphasizes Colston.

The basic quantities in the physical metrology area include length, mass, temperature, pressure, humidity, force, gas flow, density, and related measurements.

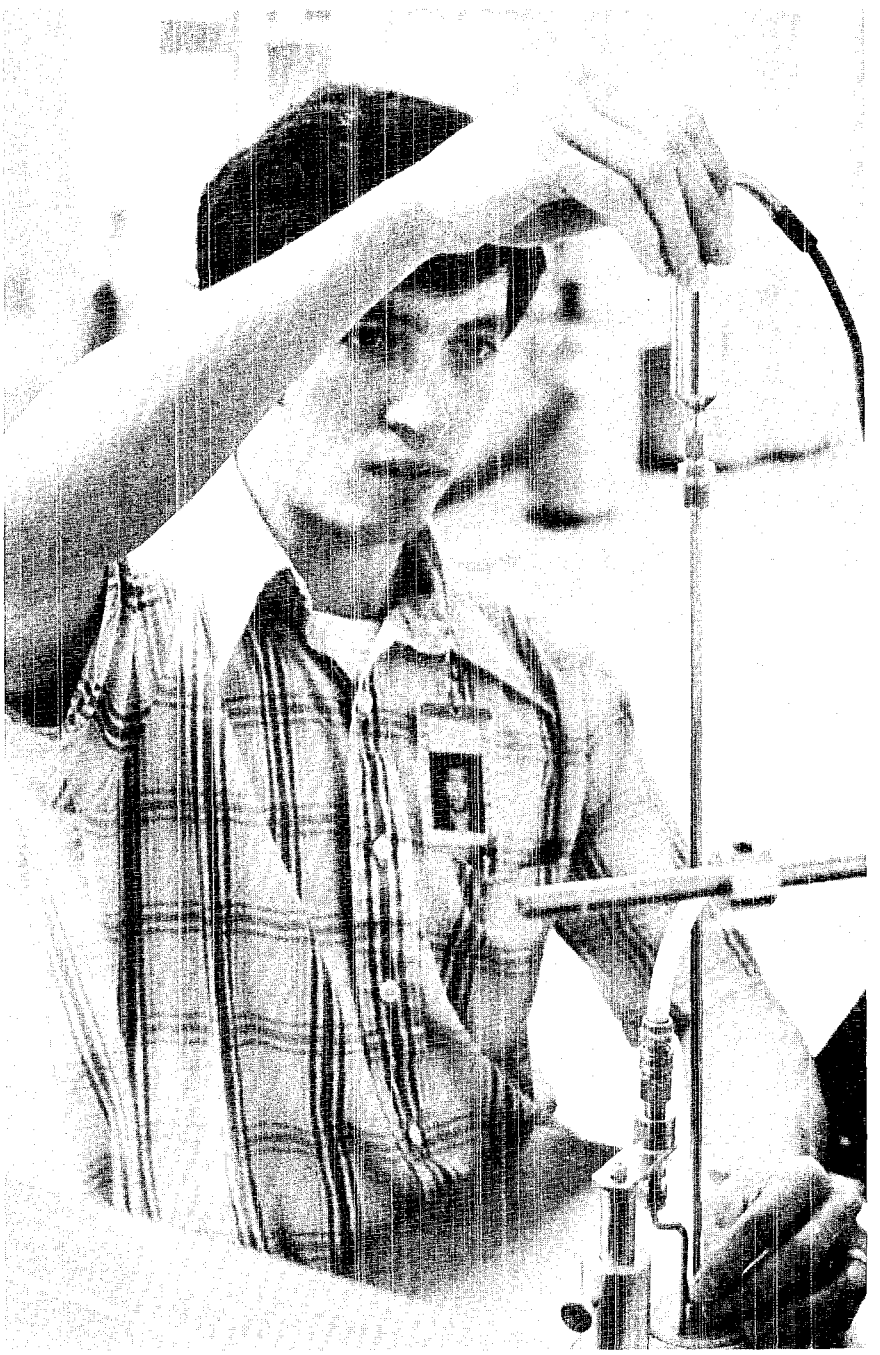
In the electrical section the basic quantities include direct current (d.c.) measurements such as resistance, voltage, and current, alternating current (a.c.) parameters such as capacitance and inductance, time, and frequency. In a later issue, *The Atom* will devote space to the electrical metrology area as it develops. This article is specifically about the physical metrology operations of the laboratory.

One part of the measurement of temperature deals with calibration of optical pyrometers (shaped somewhat like a slide projector with a lens protruding) used to provide accurate readings of high temperatures.

At present, the metrology laboratory uses pyrometers calibrated by other facilities as its standard for calibrating other LASL pyrometers, but expects to be able to calibrate its own standards soon, and use these, in turn, to calibrate LASL equipment.

Another method of calibrating pyrometers is to use a tungsten-strip lamp, also calibrated and highly accurate, to sight-in the pyrometer, which produces a voltage that is proportional to temperature.

The lamp radiates a certain amount of light when heated to a known temperature. The pyrometer is adjusted to match that value, and is read to determine how much it deviates from the lamp temperature. The calibrated lamp can be used for only 100 hours before it



Mike Salazar, E-1, places a platinum resistance thermometer into a freezing point furnace. The furnace produces a known temperature, and the accuracy of the thermometer is checked against this known temperature.

has to be checked to verify its accuracy as a standard.

The standard in pyrometry measurements is the temperature at which gold melts. All calibrations are based on this temperature.

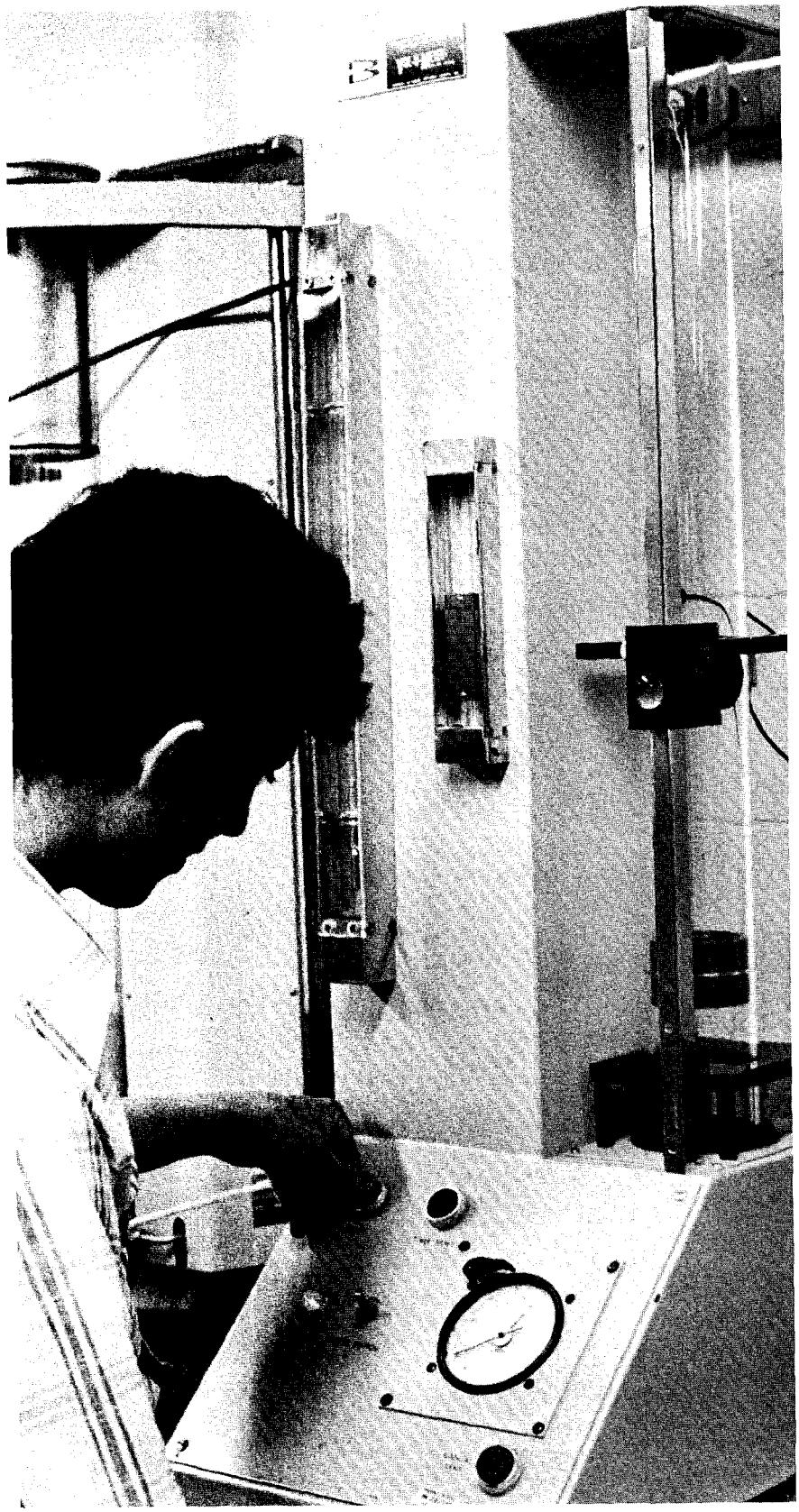
Another device used in temperature measurements is the blackbody furnace, a source of uniform light radiation at known frequencies. The furnace is not a standard, as is the tungsten-strip lamp or a calibrated pyrometer, but is set to some specified temperature and used as a reference source. The furnace will heat to about 3,300 degrees Celsius (6,000 degrees Fahrenheit).

A reference point sometimes used in connection with temperature measurement and calibration is the carbon arc furnace. It operates at the temperature at which graphite is converted from a solid to a vapor.

On the lower part of the temperature scale, the laboratory does measurements in a freezing point furnace. A platinum resistance thermometer (PRT) is used to interpolate between fixed points (defined as certain temperatures) within a certain range. The PRT is used in the lowest part of this temperature range, whereas the thermocouple, made of platinum and platinum-rhodium (10 per cent), is used in the higher ranges in the freezing furnace.

The standard in these measurements is the point at which a known substance, which is first heated, is permitted to freeze (solidify). This fixed point is a known value and serves as the standard for measuring temperatures in these lower ranges. The PRT is used to define temperatures between the fixed points of −259.34 degrees Celsius to +630.74 degrees Celsius, and the platinum and platinum-rhodium (10 per cent) thermocouple in the range 630.74 degrees Celsius to 1,064.74 degrees Celsius. Above 1,064.43 degrees Celsius, optical pyrometers are used.

In measuring flow rate, the technique is to collect a known volume of gas or liquid after flowing it through a meter, and measure the



Salazar conducts an experiment on the metrology laboratory's equipment that checks flow rate of gas through a meter.

time it takes to collect this volume, with temperature and pressure as factors. The metrology laboratory has the capacity to calibrate gas flow meters and determine the rate of flow (volume per unit of time) over a wide range of flow rates.

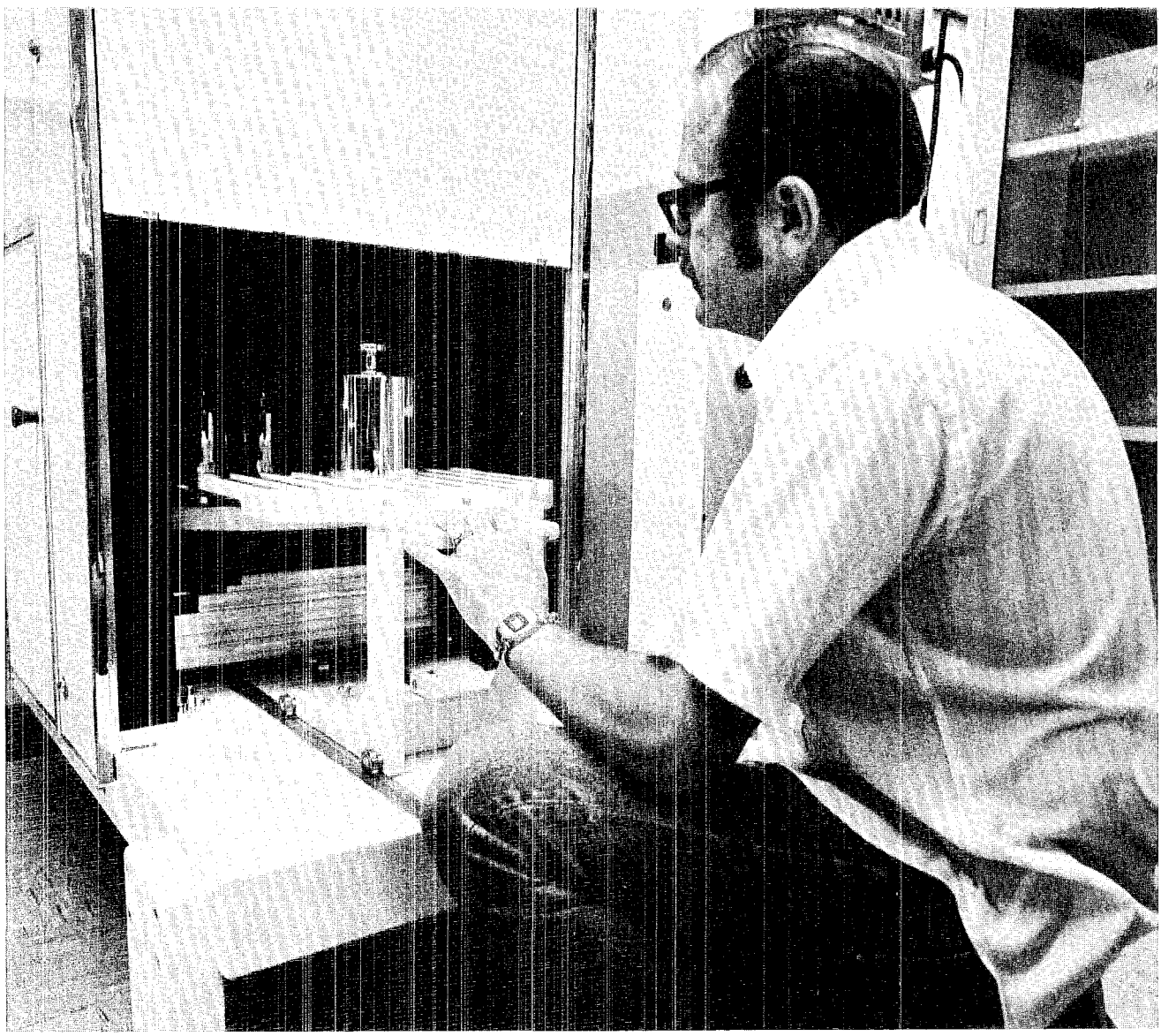
The laboratory's weight and mass measurements involve comparing a known mass or weight with an unknown mass or weight. To do this, the laboratory uses many precision laboratory balances, among them a 30-kilogram mass comparator balance, one of only a few like it in the United States. The balance is used to compare objects of nearly equal mass.

From endeavors with the mass comparator and other weight measurement equipment, the laboratory will establish a system whereby all mass calibrations can be traced to a pair of 1-kilogram standards, eliminating the need for calibration of large weight sets by facilities outside LASL.

The laboratory also determines density (mass per unit volume) in ways such as placing a previously weighed sample in a container of liquid and weighing it there to determine the volume of liquid it displaces.

The pressure measurement section of the laboratory regularly determines pressures from 55 kilopascals (8 pounds per square inch) to 276 megapascals (40,000 pounds per square inch) with 0.01 percent error. The capability is being enlarged to measure 689 megapascals

George Perrault, E-1, uses a mass comparator balance to measure an unknown mass. The balance is one of only a few in use in the United States.



(100,000 pounds per square inch) and on the opposite end of the scale, to measure pressures of 1 millipascal (about a millionth of a pound per square inch) and less, at the near-vacuum level.

Oil, gases, and liquid freon are used in the pressure system to generate pressures for calibration of gauges.

This pressure system will be made LASL's standard, and secondary standards will be checked against it. The basis of the standard is a stack of calibrated static weights. Inside the stack is a cylinder and piston arrangement of known dimensions that has been measured by NBS.

A known pressure will be generated in the oil in the system when a known number of static weights is placed on the piston. This known pressure can then be transmitted and applied to an instrument being calibrated.

To reach the accuracy required, corrections for gravity, temperature, air buoyancy, reference plane of measurement, and surface tension of the liquid must be made.

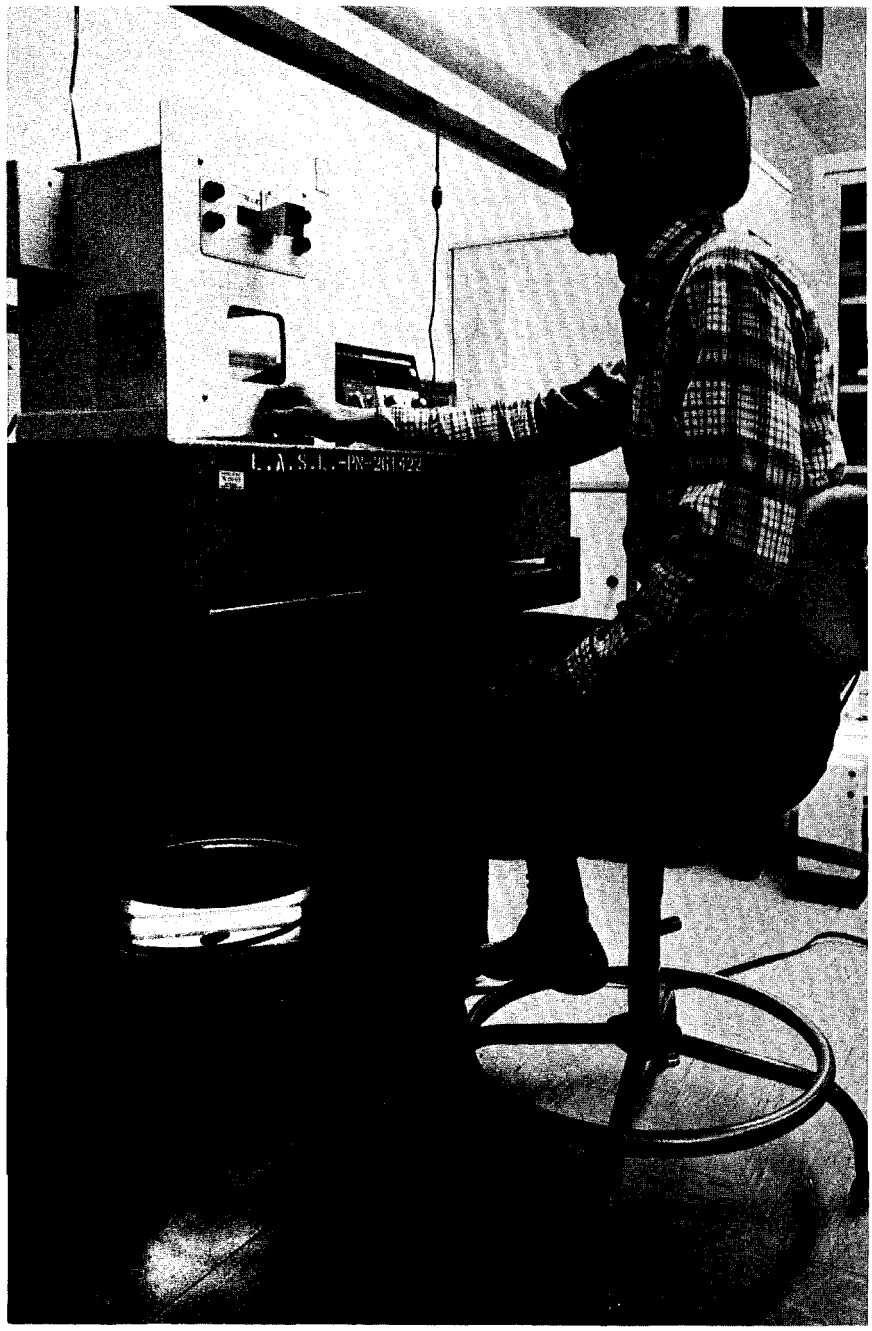
Colston notes that there is an increasing demand at LASL for reference standards for low pressure and vacuum measurements, which the expanded system will be able to handle regularly as it becomes fully operational.

Another device in the laboratory is the proving ring, used with a hydraulic press to measure force. The ring, calibrated by NBS, is used to calibrate dynamometers, springs, strain gauges, and other instrument used to measure force.

In the metrology laboratory's modulab, where temperature is

The Science Of Weights And Measures

Gauler measures the density (mass per unit volume) of a substance of a known mass suspended in the liquid-filled container at his feet.



controlled to 0.05 degree Celsius, precise measurements in length, width, roundness and other shapes, and volumes are made by a variety of sophisticated equipment.

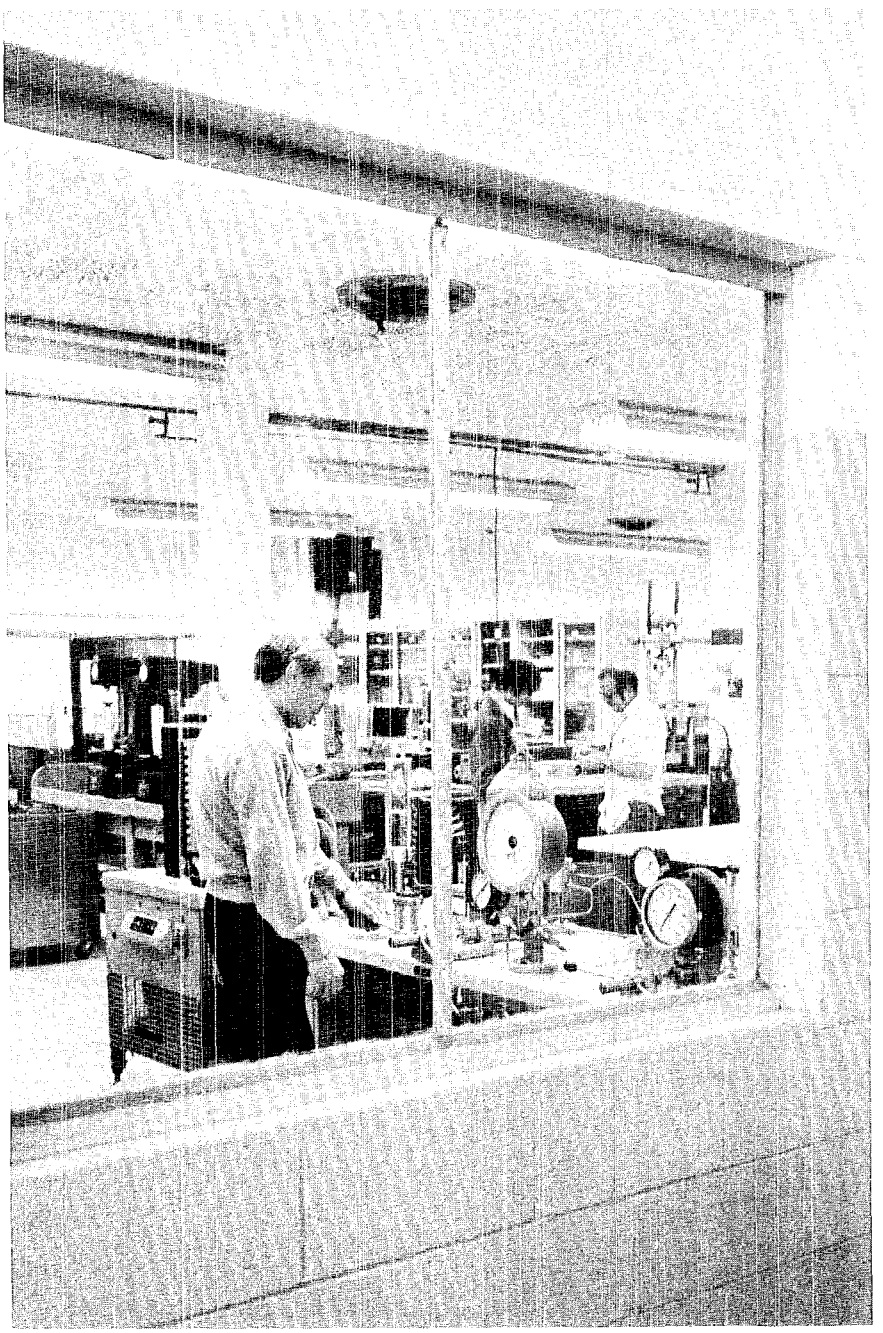
Photoelectric auto-collimators, for instance, project light onto a reflective surface and read the reflection to measure any angle near line-of-sight. For an object with parallel faces, the angle recorded by the collimator should be zero. A deviation means the object, whether it is a crystal, a gage block (a block of known dimensions to measure length, width, etc.), could have a flaw and not be as precise as it should be.

The collimators are often used to measure angles and detect flaws in crystals used in various aspects of LASL research work.

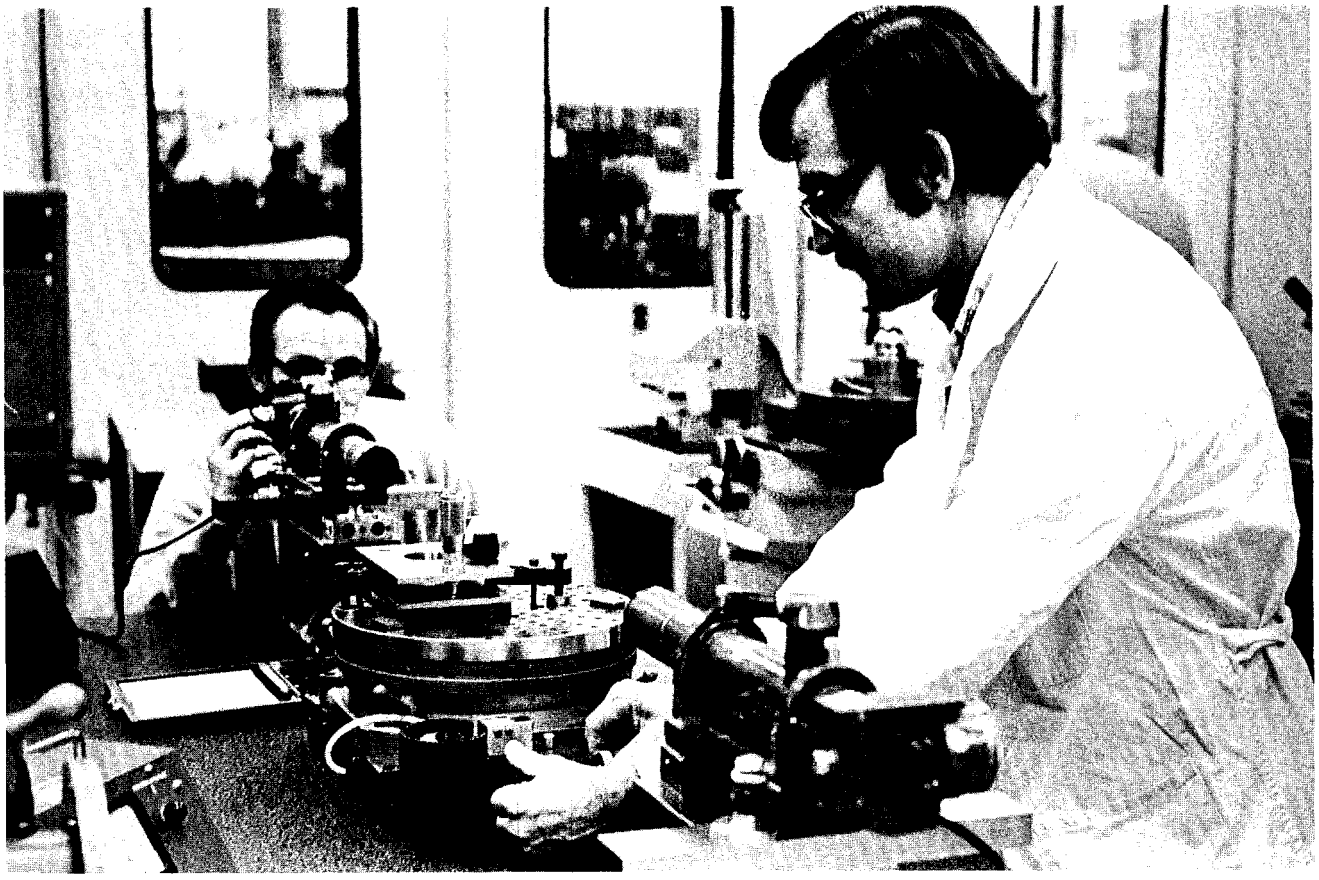
An indexing rotary table, a standard that rotates an exact number of degrees, is used to help measure angles, also.

The largest piece of equipment in the modulab is a complete measuring machine, the No. 5 Moore Universal Measuring Machine. It measures length, width, height, and roundness (verifying templates is just an example of measuring length and width accurately) to an accuracy of less than 2 millionths of a meter (80 millionths of an inch). When used with the laser interferometer, accuracy of about 0.05 millionths of a meter (2 millionths of an inch) can be achieved.

Colston adds that caution must be used in handling any standard, but especially length and width gages. Body heat and heat radiated from light sources in the room can affect the precise dimensions of



Jim Ruhe, SD-4, adjusts a pump in the pressure calibration system operated by the metrology laboratory. The extremely accurate system will eventually have the capacity to measure pressures from 869 megapascals down to vacuum level.



Elbert Colston, SD-4 group leader, peers from behind a photoelectric auto-collimator in the modulab as Tom Novak, SD-4, checks a gage block in front of the collimator. Photoelectric auto-collimators sometimes are used to determine angles of crystals, or, as in this instance, the gage block mounted on the indexing rotary table, a standard that rotates an exact number of degrees.

A gage block of exact, known dimensions is mounted on an indexing rotary table between the two auto-collimators. Novak adjusts one collimator.

a metal standard. The standards, therefore, never come in contact with skin, and usually are covered with aluminum foil to retard heat absorption.

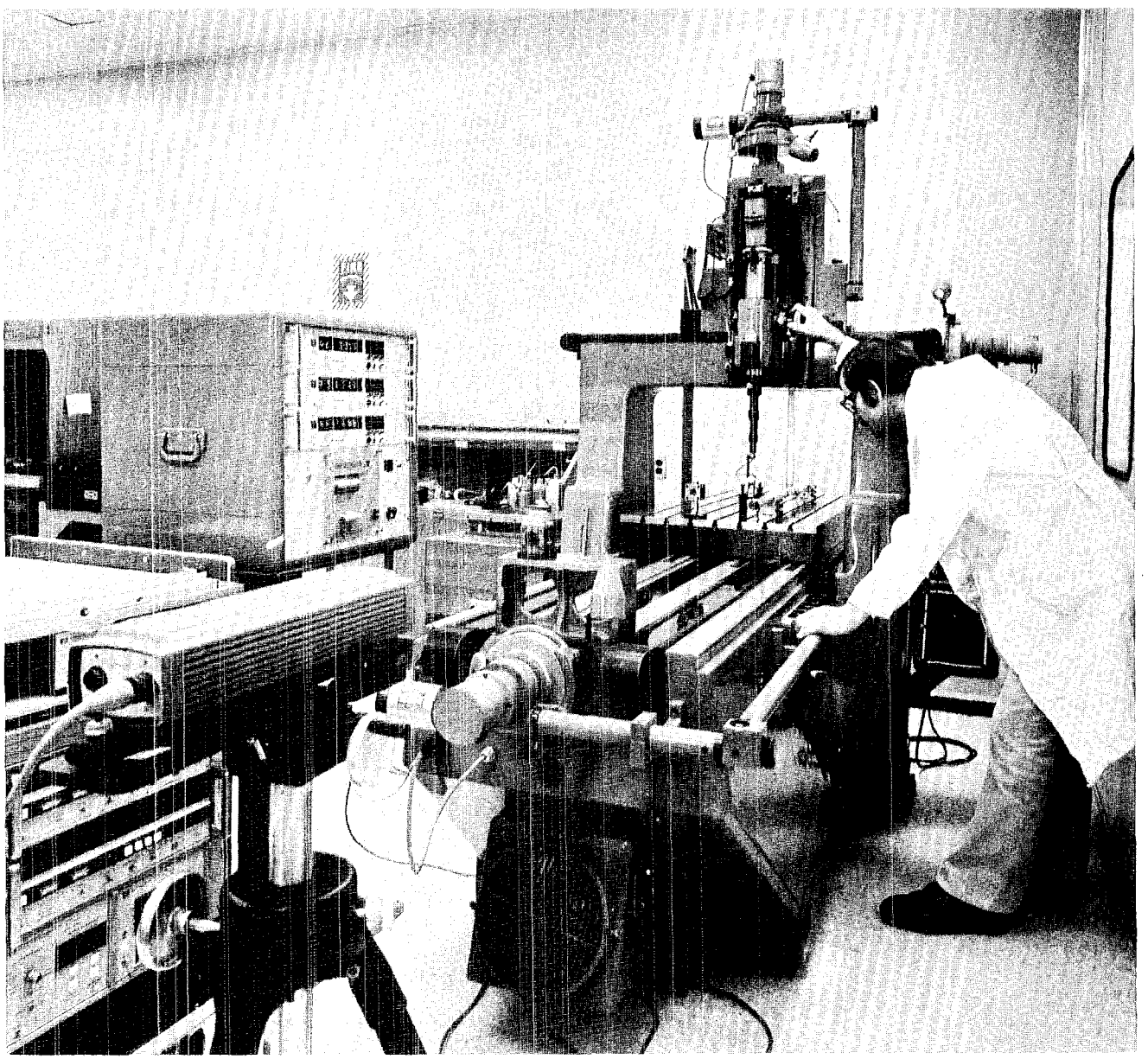
LASL's metrology laboratory has one set of primary standards in use at all times, and one set enroute to be checked and calibrated or returning from some facility where they were calibrated.

Also in the module room are surface profile measuring instruments that have resolution as great as 2 nanometers (1 ten millionth of an inch). The machines, says Colston, provide the best measurement possible with mechanical devices. The laboratory also has spheres that are standards and are used for measuring roundness.

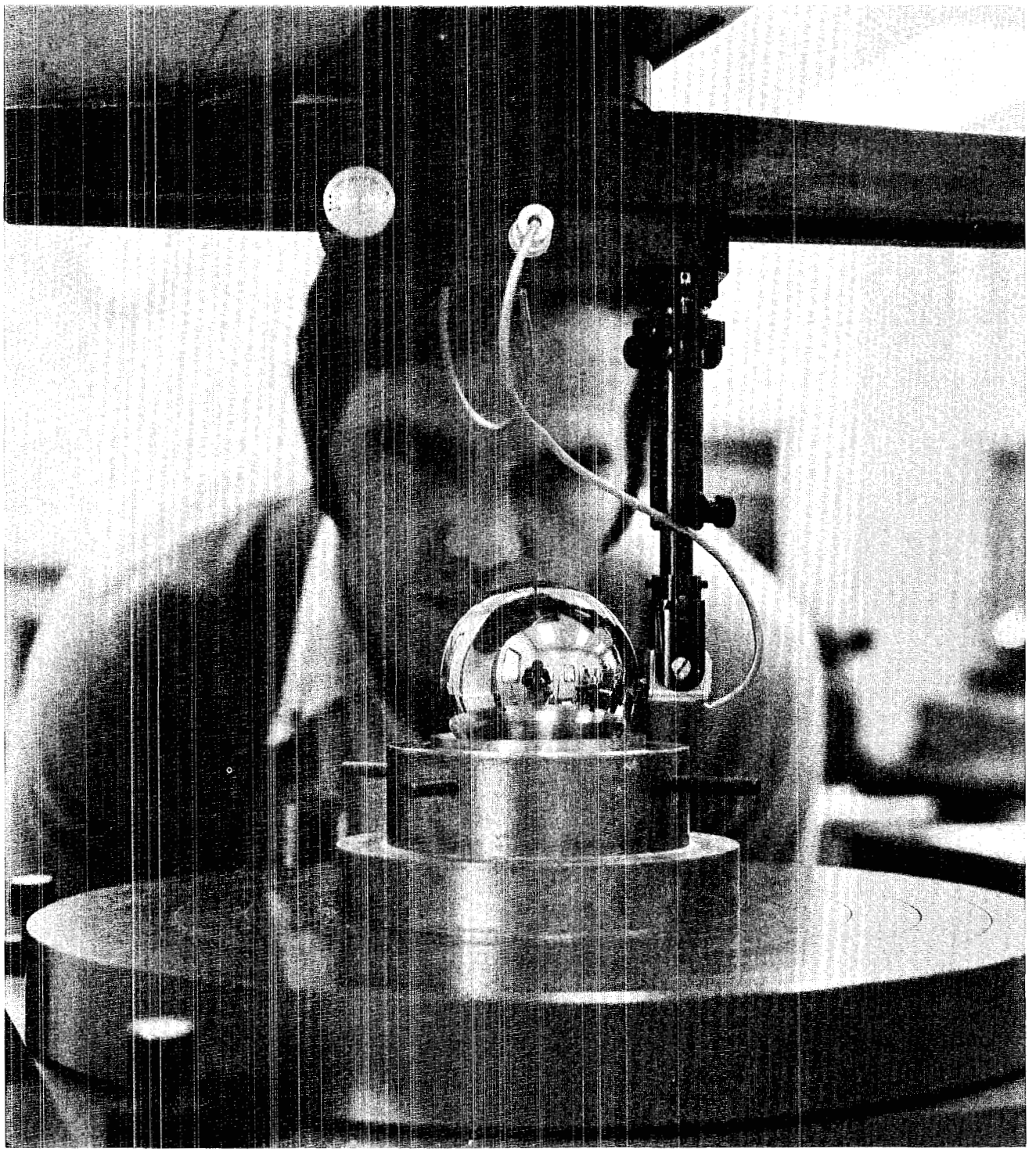
The laboratory is in the process of establishing an apparatus to generate a known humidity that can be used to establish values of moisture in relative humidity and low moisture.

"We are really just getting started," reminds Colston. "We want to have not only a calibration laboratory, but also a measurement laboratory of the highest quality. We want to be able to help solve measurement problems and add to the body of knowledge and expertise that is part of metrology, the science of weights and measures."

Novak uses the versatile measuring machine to check the length of a piece of metal rod. The machine measures length, width, height, and roundness, and also verifies templates. In the foreground is a laser interferometer, also used with the measuring machine to make very exact measurements.



Colston, left, Novak, and Gauler look at figures in a record book inside the modulab, where temperature is controlled to 0.05 degrees Celsius.



Jim Courtney, SD-4, watches a surface profile being made of a sphere which is a standard of roundness for the laboratory.

LASL Is Learning More About "Local" Deer

There has been a significant decrease in the mule deer herd on Los Alamos Scientific Laboratory property and in Northern New Mexico in general in the last 10 years, and Health Division's Environmental Studies Group (H-8) is trying to find out why.

The group wants to know not only why there are fewer deer, but they want to learn as much as possible about the animals.

An intensive study of mule deer was begun in January, 1975, because of the lack of ecological information on the animals, and because they represent a potential influence in radioactive and stable element transfer to humans. Objectives of the study are to determine the movements, distribution, and health of the local deer population.

The study is gaining additional impetus, as the Los Alamos National Environmental Research Park (NERP), an outdoor laboratory of 27,500 acres (11,000 hectares) for environmental reseach under the direction of LASL, has become a reality. The NERP will be publicly dedicated on May 26, 1977, and deer herd studies will become a part of the varied environmental research efforts within the park.

Principal techniques being used in the deer study are tagging and radiotelemetry of deer to determine movements, blood sampling and analysis to document the nutritional and health status of the herd, the use of dosimeters to estimate gamma ray exposure, and the use of pellet (excrement) group plots as an index of deer population.

Deer are captured in fall and winter in live traps baited with alfalfa and apples. Each animal is marked with ear tags and streamers, a colored neck band, and in some cases a radio transmitter to facilitate identification and tracking of individuals. Observations of marked deer are made by H-8 people, the public, and ERDA Protective Force personnel.

Blood samples are being analyzed for several blood parameters that may serve as indices of nutritional and health status. Some blood samples are given to the New Mexico Game and Fish Department for examination for bluetongue virus.

Lithium fluoride thermoluminescent dosimeters recently have been attached to the neckbands of captured deer to record radiation exposures to animals residing on Laboratory property. When these

deer are retrapped, the dosimeters will be removed and read for gamma ray exposure.

Statistical procedures were used to establish 100 rectangular plots (22 meters by 4 meters) across the Pajarito Plateau to relate pellet group densities to deer numbers. Information on the distribution of deer in the study area are also obtained from the plots. The plots are cleared in spring and fall to provide indication of seasonal use patterns.

A total of 28 deer (20 adult females, 4 adult males, 1 juvenile female, and 3 juvenile males) have been trapped, tagged, and released.

Information provided by more than 200 resightings indicates that deer generally move to lower elevations on the Laboratory as snow depths increase in winter and then return to higher elevations in spring and summer.

Individual deer usually restrict their movements to 1 or 2 mesa tops, but it is apparent that male deer move over larger areas than female deer. Also, on the basis of limited data, it appears that juvenile males move over a larger area than adult males, which may be a reflection of dispersal in the juveniles.

H-8 researchers, from left, in the top photo, Elton Karlen, Tom Hakonson, and Les Eberhardt, put a collar containing a radio transmitter on a mule deer. The transmitter, which can be tracked at a distance of up to 3 miles, will allow accurate study of deer movements. In the photo at left, Eberhardt grasps the collar and prepares to fasten it around the animal's neck.

The deer was given a numbered tag and streamers to make positive identification easier when it is resighted. In the background, left, is Wayne R. Hansen and in the trap, right background, is George Trujillo. Kneeling front left is Dan Wilson, with Karlen, Hakonson and Eberhardt in the center of the photo.

Information from the deer-pellet group plots indicates a movement of deer on Laboratory property to lower elevations during the winter, as suggested also by the tagging study. Estimates based on pellet group plots suggest that deer population densities on Laboratory and adjacent U.S. Forest Service lands are comparable to estimates for Northern New Mexico.

Population densities per square kilometer in summer varied from 6 in pinon-juniper habitat to 18 in the fir-aspen habitat. Conversely, deer population densities during the winter reflected higher use in the pinon-juniper habitat and lower use in the fir-aspen habitat.

About 10 deer have been radio-collared with a transmitter that can be tracked at a distance up to about 3 miles (5 kilometers) depending on terrain and interferences, and have been followed to obtain detailed movement data on local deer. The transmitters, which have a field life of about 2 years, are monitored frequently to determine location of individuals.

In addition to information gained by these methods, the group wants to learn more about deer food habits and ratios of young deer to adult deer, and males to females, to indicate reproductive performance.

The public is invited to participate in LASL's deer study program by reporting sightings of collared deer (give collar and ear-tag color, and sighting location) to Group H-8, 677-6682.

Eberhardt and Wilson check the tracking antenna to make sure it is operating correctly before releasing the deer. About 10 deer residing on LASL property have been radio-collared in the past several months.

Freedom . . .

. . . until next time, when the deer may again be trapped, inspected, and released unharmed to roam and provide data for LASL deer studies. Hakonson bids farewell to No. 51.

In Recognition

1946
1951
1956
1961
1966

In January more than 700 Laboratory employees received 10, 15, 20, 25, or 30 year awards during ceremonies in the main auditorium.

Family members and friends watched the award recipients being congratulated individually by Richard F. Taschek, LASL's associate director for research.

The names of the recipients are listed on the following several pages. Bob Porton, ISD-2 group leader, has supplied a brief account of several events or situations that were prominent in the years 1946, 1951, 1956, 1961 and 1966, the years when the recipients came to work at LASL.

The recipients are listed in the group or division office in which they worked as of December 31, 1976.

1946

This was the year when Los Alamosans were asking the question "What now?"

In 1946 President Truman signed the Atomic Energy Act of 1946 which provided for a 5-man civilian commission with almost complete authority over domestic development of atomic energy. It was to be the AEC's responsibility to channel atomic force into peacetime uses for benefit of the United States and mankind as a whole.

A tragic accident during work with fissionable material took the life of Dr. Louis Slotin, a Canadian scientist.

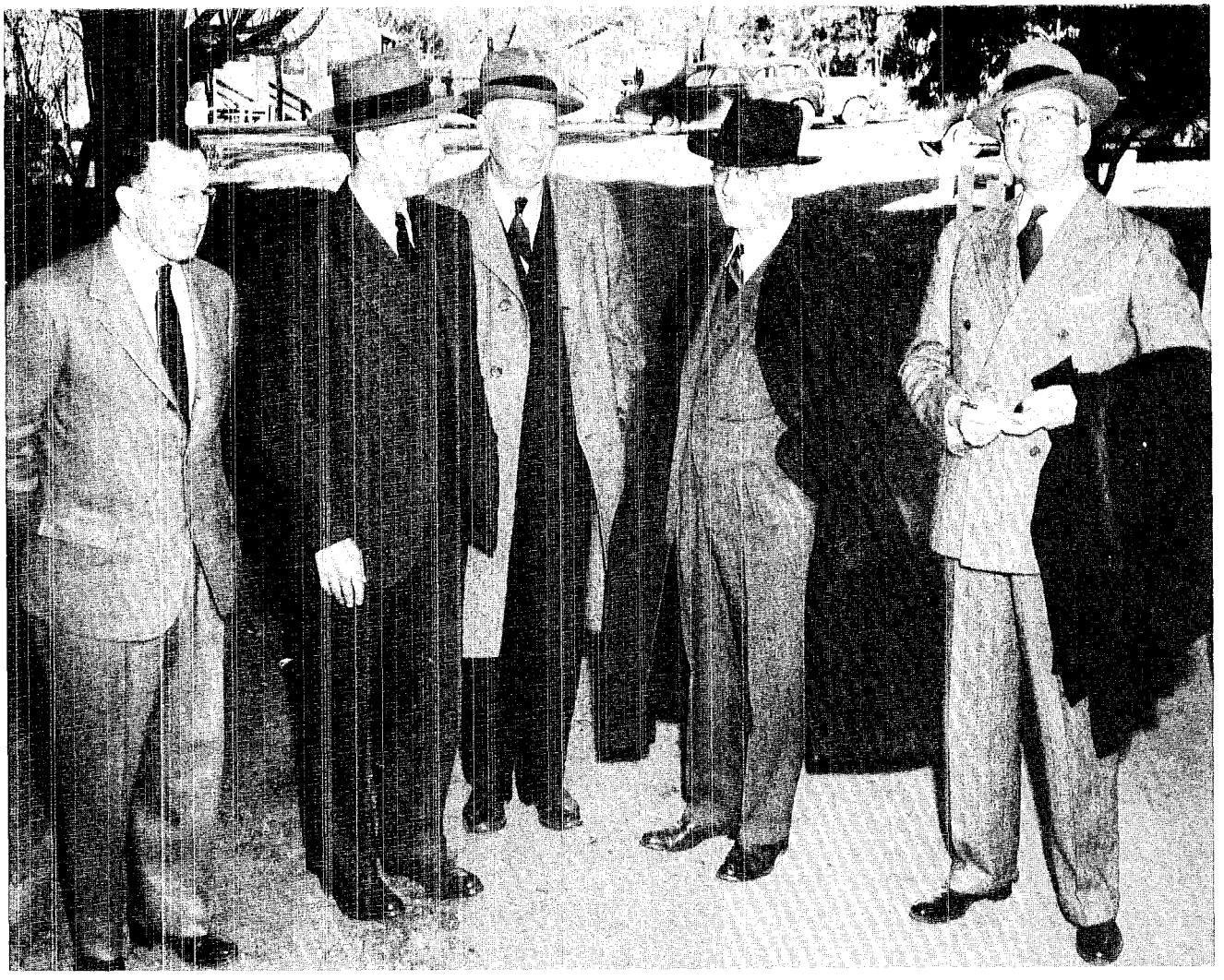
A new corporation was established, the Zia Company, to assume all post operations, including construction and maintenance. The project's first newspaper made its appearance, the "Los Alamos Times."

A contest was held by the town council to name the three main throughfares in the community. The winning names were Canyon Road, Trinity Drive, and Central Avenue. The following employees recently received their 30-year pins:

Alarid, Benjamin B., SD-1
Argo, Harold V., P-4
Bayhurst, T. L., ENG-1
Blackwell, Charles D., H-1
Bond, Avery L., J-6
Bowman, Melvin G., CMB-DO
Bramble, James J., WX-1
Bridge, James A., MP-13
Briesmeister, Arthur C., CNC-4
Carman, Thomas E., CMB-7
Chavez, Pascual P., H-1
Clancy, Michael L., WX-2
Crook, Robert C., ISD-7
Dallege, Leo C., WX-7
Davis, Neil, WX-1

The Baker event of the Crossroads series of bomb shots on Bikini Atoll in the Pacific Proving Grounds, 1946.

Diaz, Manuel B., R-5
Diven, Benjamin C., P-DO
Dunahugh, Kenneth J., SD-5
Ebelacker, Virginia, WX-7
Faussone, Roscoe A., CMB-6
Filip, Henry, AP-3
Fitzgibbon, Francis J., CMB-14
Fitzhugh, Robert S., J-8
Florin, Alan E., CNC-2
Freeborn, David M., SD-5
Fresquez, Ramon P., WX-3
Fulgenzi, Lawrence P., WX-3
Gallagher, James D., CNC-11
Gamble, Waldo E., E-1
Garcia, Ernestine, H-1
Gibson, William B., CMB-11
Gilmore, James S., CNC-11
Gilmore, Robert R., CMB-11
Giorgi, Angelo L., CMB-3
Glore, James P., P-4
Gutierrez, Conrado P., CMB-11
Harlow, James E., Q-26
Hartshorne, Pierre F., CMB-6
Hauser, Frank A., WX-3
Henicksman, Arthur L., CMB-1
Herrera, Joe H., CMB-AP
Hilton, Elmer L., WX-3
Kircher, John A., CMB-8
Krikorian, Nerses H., TD-7
Krupka, Milton C., CMB-3
Lang, Harold J., P-9
Lew, Marion S., CMB-1
Littlejohn, George J., H-1
McNeese, Wilbur D., CMB-11
MacMann, Edward N., WX-5
Maestas, Jacobo, CMB-AS
Martinez, Benito S., H-1
Martinez, Johnnie M., M-4
Mascarenas, Antonia M., ISD-4
Mench, John D., SD-DO
Montoya, Antonio J., H-1
Morgan, Arthur N., Jr., CMB-11
Mullins, Lawrence J., CMB-11
Nilsson, Clifford E., SD-2
Nordeen, Clifford E., CMB-11



Members of the first Atomic Energy Commission visited LASL in 1946. They are, left to right, Robert C. Bacher, former division leader at LASL, David H. Lilienthal, AEC chairman, Sumner Pike, W. W. Waymack, and Lewis Strauss.

Norman, Lester R., WX-3
Norwood, William I., WX-3
Oliver, Charles A., SD-5
O'Mara, Edward F., SP-3
Orndoff, John D., R-5
Osborn, James W., M-4
Pierce, Robert G., WX-3
Popolato, Alphonse, WX-3
Porter, Phil B., J-8
Potter, Robert M., Q-11
Povelites, John G., CNC-11
Rasmussen, Roger L., M-4
Rhodes, William O., CMB-11
Robbins, William C., CMB-11
Romero, William F., H-1
Russell, John H., TD-7
Sandoval, Fred R., CMB-7
Sattizahn, James E., Jr., CNC-11
Scargall, Jennie T., WX-7
Schell, Donald H., CMB-6
Schutz, James H., SD-1
Schwartz, Mortimer, WX-3
Serna, Santiago F., CMB-11
Shaffer, David S., CMB-14
Sheinberg, Haskell, CMB-6
Smith, Robert E., CMB-8
Snowden, P. Harry, CTR-4
Sojka, Zygmund E., SD-DO
Spaulding, Robert L., WX-7
Squires, Raymond E., SD-5
Stack, Francis E., SD-DO
Stone, Roy D., M-6
Suazo, Jose B., CMB-AS
Swickard, Earl O., Jr., L-10
Tafoya, Jose E., H-2
Unger, Walter A., WX-5
Van Buskirk, Marvin L., SD-1
Van Lyssel, Billie Jo, E-2
Van Vessem, Alvin D., WX-7
Varoz, Jose A., H-1
Weintraub, Larry, TD-7
Weiss, Eugene E., AO-1
West, William J., SP-10
Whyte, Dilworth N., ENG-8
Wilhelm, Richard, AADP-2
Winston, John G., E-3
Witteman, Willard G., CMB-3

1951

The Atomic Energy Commission started testing nuclear weapons at a site near Las Vegas, Nevada.

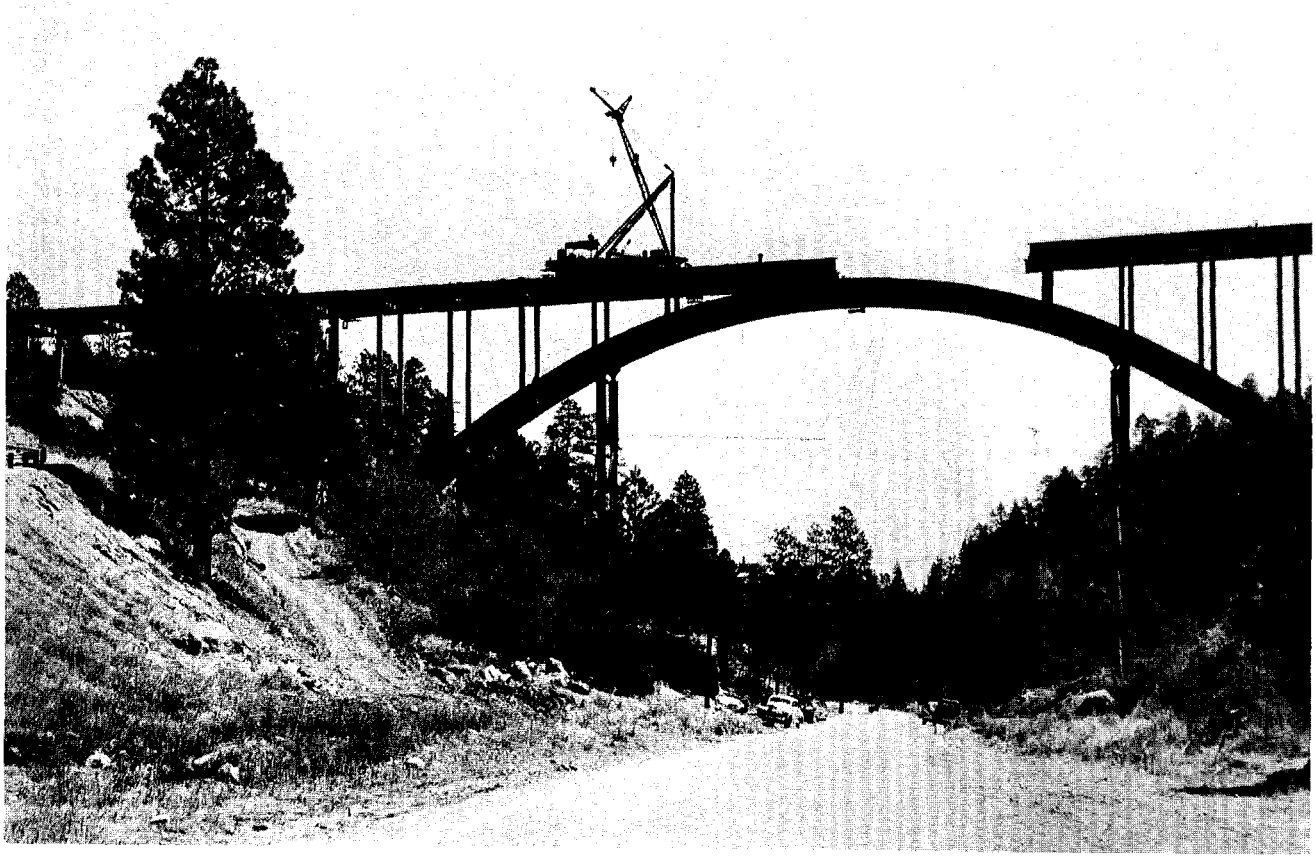
The new Community Council indulged in a burst of generosity. The profit of a square dance festival was turned over to the Council, which in turn voted magnanimously to give the profit back to the festival sponsors. The profit was 83 cents!

The cost of living went up 5.3 per cent in Los Alamos this year. But, an announcement pointed out, there was no increase in the average grocery bill during this time. The items which jumped the highest were house furnishings. Prices which remained unchanged during the year were fuel and utilities.

The new high-level bridge spanning Los Alamos Canyon was opened. New hires who joined LASL in 1951 included the following who have been awarded their 25-year service pins:

Alei, Mohammed, Jr., CNC-4
Anderson, Gordon H., SD-DO
Anderson, James C., WX-7
Apodaca, Joe B., SP-3
Armstrong, Dale E., CNC-4
Baggett, Lester M., M-4
Baldwin, Seth, SP-2
Bame, Samuel J., P-4
Bannerman, Daniel E., L-4
Bard, Richard J., CMB-8
Barnes, Robert L., WX-3
Barrington, Gene M., SD-5
Beaumont, Arthur J., CMB-11
Bendt, Philip J., P-2
Bergamo, Emily H., AO-6
Bergamo, Louis R., CMB-5
Blatti, Claude T., SD-5
Blatz, Laurence A., CNC-2
Bradford, Donald H., C-6
Brandt, Daniel, SD-1
Brasfield, William D., WPC-1
Brown, Jack R., WX-1
Browne, Phillip L., TD-9
Burkhardt, Louis C., CTR-2
Busse, C. Eugene, SD-5
Bustamante, Santiago J., CMB-7
Bustos, Eloy J., SP-11
Byers, Cleo C., R-5

The last span of the bridge was put in place in 1951.



Calvin, Ross R., Jr., WX-3
Carlson, Loren A., WX-7
Case, James R., ENG-4
Cashwell, Edmond D., TD-6
Claybrook, Billy R., ISD-7
Cooper, Ethel D., R-DO
Cotter, Theodore P., AP-DO
Cowan, Robert D., T-4
Cox, Summers, H., H-9
Crisler Tommy Leo, CMB-6
Crowe, Warren E., DIR-FMO
Desilets, James L., ENG-14
Devaney, Marjorie A., C-1
Dion, Joseph R., ENG-4
Doddridge, Robert P., SD-1
Dow, Grove S., Jr., CMB-7
DuBois, Frederick W., WX-3
Dunwoody, Wade E., R-4
Edeskuty, Frederick, Q-26
Elliott, Reed O., CMB-5
Elliott, Robert J., H-1
Eutsler, Bernard C., H-5
Farrar, Ernestine T., H-2
Fickett, Wildon, T-4
Freidline, Lucille, AO-DO
Fretwell, James H., Q-26
Gardner, Ross D., CMB-1
Gauler, Raymond S., WX-3
George, Irvin S., SD-1
Gilbert, Martin W., SD-1
Ginder, Robert K., SD-5
Gomez, Loyola E., AO-1
Gotti, Richard J., AO-3
Gray, Gordon C., SD-5
Groff, Clifton B., SD-1
Hammel, Jay E., CTR-5
Hansen, Jeanette J., C-1
Harmer, Clarence L., SD-5
Heath, William S., WX-3
Herin, Walter B., J-7
Hoffman, Carroll G., L-4
Holmberg, Raymond C., MP-7
Horpedahl, Leroy C., AP-DO
Hudgins, James D., ISD-9
Hudgins, William G., C-1
Jackson, Frank M., M-2
Johnson, Karl W. R., CMB-11
Johnston, Richard E., L-1
Jones, Llewellyn H., CNC-4
Jones, Thomas I., Jr., CMB-6
Kazek, Chester S., Jr., C-4
Keenan, Thomas K., H-7
Kelley, Donald W., CMB-11
Kimble, Ernest E., WX-3
Larson, Robert J., SD-1
Lawrence, James N. P., H-1
Lazarus, Roger B., C-3
Lindblom, Gustaf N., ISD-7
Lucero Alfonso, SP-3
Lujan, Virginia P., ISD-4
Martinez, Carlos A., WX-3
Martinez, Gilbert J., M-4
Martinez, Mary G., ISD-5
Matheson, John C., ENG-1
Meadows, Delbert L., M-6
Means, John W., SD-5
Medina, Camilo E., Jr., CTR-2
Montoya, Benito, SD-DO
Moss, Shirley W., AO-2
Mynaugh, Adela, CMB-11
Nance, Robert L., CMB-11
Nereson, Arnold T., SP-11
Nims, Maxine I., CMB-14
Olsen, Eugene E., SP-3
Ortega, Leo A., AO-6
Penland, J. Robert, H-3
Peterson, Carl E., CMB-11
Pickett, Robert T., SD-5
Ribe, Fred L., CTR-DO
Riggs, Edward M., SD-DO
Roybal, Daniel, CMB-6
Ryan, Bernard L., ENG-14
Salaz, Pres E., ISD-7
Sandoval, Miguel A., AO-5
Sawyer, George A., CTR-DO
Schlatterer, Louis, SD-DO
Schlosser, John E., M-1
Schmidt, LeRoy C., SD-5
Schmitt, Richard T., SD-5
Schoolcraft, Albert, E-1
Seagrave, John D., P-DOR
Sherman, Robert H., Q-26
Simmons, James E., P-DOR
Siverly, Pauline F., WX-3
Stein, Patricia C., H-5
Stenholtz, Roy J., SD-5
Sterkel, Fred A., SD-5
Sundberg, Delbert F., ISDO
Susco, Dante V., T-13
Sweet, Sherman B., AO-DO
Tate, Raymond E., CMB-5
Terrell, N. James, L-2
Tilby, Albert E., SD-4
Trujillo, Lee L., SP-4
Valdez, Bartolo, CMB-14
Wagner, Robert G., R-5
Wallis, Malcom, P-9
Waugh, Harry G., WX-1
Weber, Wilfrid J., H-DO
Whitehead, George H., SD-2
Williams, Arthur, L-4
Wilson, Donald D., SD-5
Young, James L., III, CNC-2
Zastrow, John A., MP-11
Zellman, Mary M., SD-2
Zerwekh, Al, CMB-1

1956

In 1956, the Community Relations Office was established as part of the Personnel Department. The office was created to assist Laboratory employees in their dealings with the AEC, Zia and other agencies and contractors. It also represented LASL in community affairs.

Joining the staff were 3 official "hostesses" who assisted families of new employees to adjust to living on the Hill.

The big gripe, as usual, was housing. At one time, there was a moratorium on hiring because of the lack of available family housing. During the year a private real estate firm distributed a questionnaire researching the desirability of private housing. Eighty-five per cent responded favorably that they would be interested in owning their own homes. A public meeting was held to determine the interest in

possible purchase of land on Barranca Mesa, north of the Golf Course.

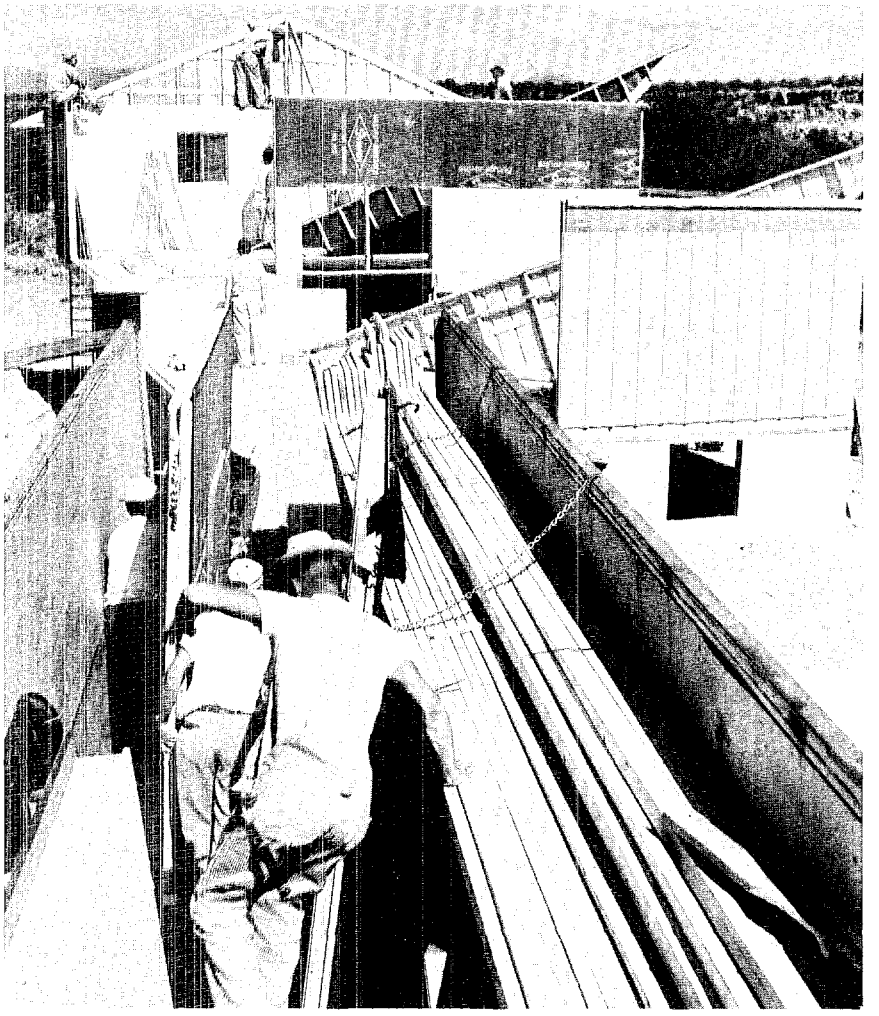
A new 260-seat cafeteria west of the Administration Building on South Mesa was completed and began operation. Among those who recently received their 20-year University of California service pins are:

Allen, Jerry E., J-14
Allen, Ora M., T-13
Arellano, Gerson, WX-3
Bacon, Edgar A., Jr., AO-DO
Bailey, Arthur G., CTR-4
Balog, George, AP-2
Barlich, Albert H., TD-4
Beiler, Robert C., J-3 (NTS)
Bender, John H., Jr., CMB-QA
Bennett, Elbert W., J-14
Black, Lucien M., J-16
Blais, Normand C., CNC-2
Bramlett, Walter R., ISD-5
Brinkley, Forrest W., Jr., T-1
Brower, Sidney H., MP-7
Caird, Robert S., M-6
Carroll, Thomas A., L-1
Carter, Glenn L., C-4
Chandler, Thomas E., WX-3
Chaney, Melvin C., WX-5
Collier, Concha B., CMB-1
Connellee, Rodger S., Jr., ENG-DO
Croley, Dale C., CMB-1
Cutler, Louis W., MP-DO
Daly, Richard J., WX-3
Deinken, Herman P., WPC-1
Deverall, John E., R-3
Duran, Bennie, SP-2
Durham, Franklin P., L-DO
Edgett, Ivan K., WX-3
Ehart, Edwin P., CMB-6
Ehrenkranz, Theodore E., H-3
Ferdinand, Edward O., R-5
Fowler, Clarence M., M-6
Fowler, Eric B., H-8
Franke, Paul R., Jr., MP-7
Fuentes, Gilbert L., CMB-AP
Garcia, Ramon N., WX-3
Gardella, Robert W., WX-4
Givens, Arlin R., Jr., J-1
Gonzales, Ramona C., AADP-1
Gore, Raymond A., E-DO
Gould, Walter D., J-10
Green, Walter V., CMB-8
Grisham, Genevieve, CNC-11

Mrs. Eugene Kerr, right, was one of LASL's official "hostesses" in 1956, and in this picture introduces a new arrival to Los Alamos to a member of the bank staff.

Gursky, Judith M., P-9
Hall, Vinson M., ENG-4
Harrington, Betty J., J-13
Hasenbank, Alvin G., ENG-2
Heath, Virginia G., CMB-5
Heimbach, David A., ISD-5
Heller, Leon, T-5
Helmick, Herbert H., R-5
Herrera, Gilbert R., CMB-14
Herrick, Claude C., CMB-8
Holt, Joseph M., Jr., TD-DO
Horton, Glen E., ENG-2
Ingwerson, Darrell L., WX-7
Jackson, Darryl D., CMB-1
Jacobson, Jack D., T-4
Janney, Donald H., M-8
Johnson, Jack E., WX-1
Juveland, Allan C., TD-4
King, Jane M., TD-9
King, Jean, L-DO
Kmetko, Edward A., T-4
Kohl, Donald K., MP-12
Krenzien, Lawrence F., J-8 (NTS)
Larson, Thomas E., WX-2
Linder, Charles A., WX-4
Lindsey, Jean A., H-5
Linke, Marvin D., ENG-12
Lizut, William J., WX-3
Loewenstein, Shirley A., AADP-1
London, J. Ronald, M-1
Lopez, Reymundo J., ENG-2
Lory, Robert C., CMB-7
Luders, Robert E., P-9
Lyon, Virginia E., ISD-10
Maltrud, Herman R., L-4
Manger, Charles E., MP-8
Manthei, Allen R., WX-5
Martinez, Benny A., SD-DO
Martinez, Eleanor, ISD-7
Marx, Edna E., H-1
Maxwell, Calvin C., WX-3
Medina, Antonio I., H-1
Mikkelson, Carl A., Jr., WX-3
Montoya, Eliseo F., H-8
Morton, William H., Jr., M-3
Motz, Henry T., P-DO
Murry, Ruby I., AO-DO
Newcom, Frank D., P-2
O'Keefe, Matthew J., ISD-7
Olson, William M., CMB-11
Ortega, Enriques F., ISD-7
Orth, Charles J., CNC-11
Ortiz, Gilbert R., ISD-5
Patrick, Alton J., L-1
Petersen, Donald F., H-DOT
Phillips, Clara B., H-5
Pirtle, Dortha J., T-13
Porto, Anthony L., WX-3
Porton, Robert Y., ISD-2
Prewitt, Robert C., WX-1
Rasmussen, Jane K., C-1
Rayburn, Harold E., SD-DO
Reisfeld, Martin J., AP-3
Renfro, Richard L., Q-24
Richard, Jack R., H-1
Richardson, Robert W., ENG-9
Richerson, Nathaniel K., CMB-6
Roberts, Jewell N., WX-7
Robertson, Richard H., L-4
Rose, Donald G., WX-8
Rottmayer, Doyle, SD-2
Roybal, Benigno, P-9

Schott, Garry L., Q-DO
Scolman, Theodore T., J-DO
Sibbitt, Wilmer L., Q-11
Simes, Betty J., T-DO
Singer, Sidney, L-1
Smith, William B. C., P-9
Stone, Sidney N., J-10
Tafoya, Jose N., WX-3
Tatom, Jerry M., J-6
Thorn, Linas L., MP-7
Trexler, Vernon L., J-14
Trujillo, Eliza, H-8
Ulibarri, Jose M., ISD-7
Wackerle, Jerry D., WX-7
Wageman, William E., CNC-4
Wagner, Paul, CMB-8
Waldschmidt, Leo A., CMB-14
Waldschmidt, Robert, SD-1
Ward, John W., CMB-5
Warren, John H., J-12
Whalen, Paul P., TD-9
Willbanks, Emily M., C-4
Wilson, Mahlon T., MP-7
Woolsey, Joseph W., Jr., R-1
Wooten, John K., Jr., C-DO
Yost, Herbert F., WX-1



In 1961, construction of homes in White Rock began.

1961

A contract was awarded by the AEC to a private firm, the Noxon Construction Company, to start the White Rock housing development. Many local people signed up to purchase new homes.

University of California Chancellor Glenn T. Seaborg was named chairman of the Atomic Energy Commission by President John F. Kennedy, thus becoming the first scientist to head the commission.

LASL opened the doors to the new Stretch Computer Building for a one day "Open House." The Stretch computer, billed as the grandest of them all, was capable of operating 20 to 30 times faster than LASL's 704's on floating time calculations.

Harold M. Agnew, alternate W Division leader, was appointed to the post of NATO science advisor to General Lauris Norstad, Supreme Allied Commander, Europe.

Los Alamos became the first city in the nation to survey and stock fallout shelters for the entire population. This community was designated as a Pilot City by the Department of Defense. Spaces were found for 13,000 residents under the new national Civil Defense program. Among the newcomers who took part in the activities were those Laboratory employees who joined the staff in 1961 and were recently given their 15-year service awards:

Arzola, Frank, ENG-2
Auchampaugh, George F., P-3
Baca, Charlie H., SD-1
Bateman, Alfred G., J-7
Bieri, John M., R-2
Bieri, Mary R., H-7
Blewett, Patrick J., R-7
Bohl, Richard J., L-10
Brooks, George H., M-1
Brooks, Mary R., H-4
Bryant, Lawrence E., Jr., M-1
Caldwell, John T., R-3
Carpenter, Marvin R., C-4
Carroll, Mary N., SD-2
Clark, Edward L., CMB-7
Clifton, David G., CMB-11
Craig, Harry W., H-1
Cruz, Ralph A., ISD-5
Davis, Cecil G., Jr., J-15

Davis, Robert E., ISD-3
De Field, James D., H-5
De Poorter, Gerald L., AP-4
Dunn, Eleanor D., MP-DO
Eddleman, Troy L., TD-4
Ekberg, Ethen L., MP-7
Emelity, Ludgard A., H-7
Ettinger, Harry J., H-5T
Evans, Winifred D., P-4
Farnsworth, Fredie N., CTR-9
Ferguson, Victor, SD-5
Frentzel, Mildred J., ISD-10
Gaetjens, Paul D., DIR-ADLL
Garcia, Jose M., E-DO
Gardner, Samuel D., DIR-ADWA
Garinger, Dorothy S., CMB-5
Gilley, Corbin L., CMB-11
Green, Jere L., CMB-11
Griffin, James H., WX-3
Hanners, John L., H-9
Hanson, Donald L., R-4
Henry, Carl N., R-2
Heyman, William J., CMB-11
Holland, Redus F., AP-4
Jolly, Edward L., Jr., L-1
Kirk, William L., R-DO
Klaer, Margaret C., WX-DO
Lane, Harley E., L-4
Lautenschlager, Melvin, SD-5
Lea, Walter B., WX-3
Lobb, Betty M. L., SP-DO
Locke, Donald M., WX-7
Loggains, Christopher G., ENG-DO
Lucas, John C., TD-7
McCormick, Robert N., WX-7
McInteer, Carlotta R., T-13
Maestas, Jose P., SP-3
Maier, Otto A., SD-DO
Malenfant, Richard E., Q-10
Mann, Lawry W., CTR-6
Marien, Donald A., SD-1
Martinez, Mable V., SP-10
Mathews, Robert W., WX-3
Meyer, Kenneth A., TD-9
Minor, Robb C., CMB-QA
Morris, Roger A., M-1
Morris, William L., ENG-2
Niebuhr, David A., Jr., J-6
Nutter, Murlin J., L-1
O'Connor, Rosemary H., M-8
Olcott, Alan L., L-DO
Olivas, Jerry R., M-6
Ortiz, John P., H-5
Partridge, Ray F., ENG-DO
Pepin, Robert L., SD-1
Perkins, Roger B., L-DO
Peterson, Donald M., R-5
Petrie, Robert C., WX-3
Petty, Roy L., CMB-11
Pierce, Richard A., H-1
Pollat, LaVerne L., E-2
Quintana, Johnny N., CMB-1
Rael, Robert E., J-1
Randolph, Donald L., ISD-7
Rector, Marjorie R., DIR-O
Rivera, Rosella E., SP-DO
Robinson, Harold, P-11
Rodgers, William C., WSD
Rodriguez, Gilbert J., ISD-5
Rodriguez, Joe E., CMB-14
Salazar, Tony H., H-1
Sandoval, Abad E., C-1
Sandstrom, Donald J., CMB-6
Simmons, J. Edward, CMB-11
Smith, Frances M., C-3
Smith, Welton, ENG-4
Stanlick, Thomas K., WX-3
Stevens, Ralph R., Jr., MP-12
Steyert, William A., Q-26
Stroik, Paul J., MP-7
Strong, Ian B., P-4
Taylor, Louise S., M-4
Tercovich, Renato G., L-10
Thomas, Olan E., CMB-11
Thomas, Scott J., L-9
Thorn, Patricia A., R-DO
Thorn, Wayne K., MP-8
Valencia, Pita E., P-14
Velarde, Wilbur A., ISD-7
Wagoner, George S., Jr., WX-3
Waugh, Betty, W., MP-9
White, Robert L., CMB-6
White, Roy E., Jr., C-1
Williamson, Kenneth D., CTR-9
Wilson, Andy R., WX-3
Wingert, Anna R., H-2
Woods, Richard, P-9
Yarema, Peter, J-3
Zastrow, June R., CMB-DO

1966

During this year, Norris Bradbury, LASL Director, was presented the Department of Defense Distinguished Service Medal at a ceremony in the Pentagon.

LASL was designated as a registered National Historic Landmark. A log and stone structure near Ashley Pond was erected to house the U.S. Department of the Interior plaque. A duplicate plaque was placed at the entrance to the Lab's Science Museum.

The Los Alamos High School Hilltoppers won their first State Football Championship in 1966. And finally, Trinity Drive, the towns' main east-west traffic artery, was widened to accommodate 4 lanes of traffic after the removal of the Sundt apartments. Some of the 10-year service-pin recipients who enjoyed the local gridiron season and the improved traffic conditions were:

Abeyta, Joe R., CMB-AP
Allenson, Ray E., WPC-2
Allison, Paul W., P-11
Allshouse, George O., TD-2
Anderson, James L., CMB-3
Arellano, Jose A., SD-DO
Armijo, Valerio, MP-8
Baca, Teresa E., SP-12
Baldwin, Thomas S., MP-7
Barasch, Guy E., J-10
Beattie, Willard H., AP-4
Benavidez, Facundo J., H-4
Bentley, Bill F., L-10
Bettinger, Walter J., L-10
Biddle, Rodney S., J-16
Blake, Rodger D., CMB-6
Breshears, Wilbert D., AP-4
Brown, Wilbur K., TD-7
Burdette, Robert S., ENG-4
Butler, Millard T., H-10
Cady, Robert L., MP-8
Camillo, Dorothy E., C-9
Candler, Robert J., Q-26
Cappis, John H., CNC-11
Carpenter, Bernard, L-4
Carter, William R., Jr., CMB-14
Chaffee, Ara D., WX-4
Christiansen, Ralland L., MP-7
Christman, Ronald D., C-4
Churchman, Jerry D., SD-2
Cooper, Jennie G., CMB-1
Cordova, Tonie V., DIR-FMO
Courtney, Georgia P., CMB-8
Cramer, William E., E-1
Cross, Jon B., CNC-2
Cruz, Jose U., L-4
Cushing, Barney A., M-2
Davies, Morris W., CMB-AS
DeField, Regina A., P-4
Denbow, Ernest R., M-4

Dorsey, Esther G., H-1
Dudziak, Donald J., T-1
Dunn, Jerald G., GMB-11
Eaton, Edwin E., GMB-6
Edwards, Lyle E., WX-3
Elder, John G., H-5
Escobedo, Ray A., J-6
Essington, Edward H., H-8
Feiertag, Thomas H., M-1
Foley, William R., ENG-2
Ford, Wendell, E-5
Forman, Peter R., CTR-8
Forrest, Robert P., Jr., ENG-8
Foster, Eric S., P-14
Foster, Richard D., WX-8
Foyt, Dorothy L., PER-6
Gallegos, Eliseo, WX-3
Gardiner, Marjorie H., WX-1
Gast, John T., J-7
Gilbert, Leola D., H-1
Gill, Dennis H., L-2
Gill, Sandra L., C-DO
Gillespie, Claude M., DIR-O
Gordon, Robert A., ISD-7
Gray, Gomer, WX-7
Griffin, Reta K., ENG-DO
Gutierrez, Cleo H., MP-1
Gutierrez, Jose E., ISD-5
Hafer, John F., L-5
Hammer, Charles F., CTR-4
Hanawalt, Ellis C., MP-10
Hanold, Robert J., Q-DOT
Hansel, James M., Jr., GMB-1
Hardy, Granville E., MP-11
Hartmann, John R., P-4
Hartway, Bobby L., E-DO
Hastings, Ray D., R-2
Hawthorne, Donelle C., E-1
Hayes, John K., WPC-2
Hemphill, Richard A., ENG-9
Henderson, Dale B., T-6
Herrera, Ramon M., SP-1
Hesch, Victor L., AP-1
Hill, Joseph F., J-6
Holland, Laurence M., H-4
Holleman, Helen M., T-2
Holmes, Everett D., Jr., Q-12
Holterman, Daniel C., MP-1
Hughes, Floyd W., Jr., GMB-11
Hughes, Wilmer W., GMB-6
Imamura, Kenneth T., AP-1
Jacks, Gordon L., J-DO
Jalbert, Roland A., H-1
Jarvis, Eddie G., ENG-14
Jones, Delbert M., TD-7
Kelley, Gregory M., CNC-11
Kirby, Afton S., MP-7
Koczan, Steven P., MP-8
Koski, Nancy L., GMB-1
Kottmann, John H., GMB-QA
Kozubal, Andrew J., E-5
Laros, John G., P-4
Laros, Julia Ann, H-5
Laux, Jimmy D., WX-3
Lawrence, Donald F., J-8 (NTS)
Lawrence, Thomas A., SD-5
Lee, Kenneth, T-6
Liska, Donald J., MP-9
Lucero, Jacobo P., M-1
Lyons, Kenneth M., MP-11
McCabe, Charles W., E-5
McClellan, Dolly M., T-2
McMullen, John W., WX-4
McPherson, John W., L-4
McTeigue, Maria V., G-1
Maestas, Tony J., SP-4
Magill, Roger R., G-1
Magnuson, John E., GMB-6
Martin, Jimmie T., J-16
Martin, John C., H-10
Martinez, Eleuterio, Jr., H-9
Martinez, Lorraine J., WSD
Martinez, Mauricio P., SP-3
Mayne, Arthur W., CTR-9
Medina, Paul, SD-5
Metzger, Daniel S., J-14
Miller, Wynoka F., P-4
Mondragon, Abelardo A., CTR-1
Morales, Reynaldo, WPC-1
Morrow, Delores A., H-8
Mueller, Barbara A., GMB-3
Mullaney, Paul F., H-10
Nasise, Joseph E., GMB-3
Nicholson, Nicholas, R-2
Noble, James D., SD-4
Norris, A. Edward, DIR-OFF
O'Brien, John E., DIR-ADASF
Olcott, Lois L., ENG-3
Parsons, Jimmie G., ENG-4
Piatt, Robert A., WX-3
Potter, Jerry M., MP-1
Pretzel, Mary E., GMB-3
Price, Carol E., J-14
Putman, William E., WX-1
Quintana, Carmel A., AO-2
Rader, Joanne H., SD-DO
Raud John L., WX-8
Richmond, William L., ISD-1
Rodriguez, Isabell A., G-1
Romero, John R., SD-5
Romero, Manuel F., H-1
Ryan, Robert R., CNC-1
Sanchez, Amadeo, L-1
Saponara, Arthur G., H-9
Sedlacek, William A., CNC-11
Segura, Thelma D., G-1
Seitz, Barbara R., L-10
Serrano, Delfido, Q-DO
Shadel, Darryl H., M-2
Shipley, James P., Jr., R-1
Shlaer, Sally D., MP-1
Sinclair, Kenneth A., AADP-1
Smale, Richard F., H-1
Smith, Howard F., WSD
Spence, Leona M., SP-3
Stewart, Walter F., Q-26
Stokes, Robert W., MP-7
Stovall, Leonard A., M-3
Strong, Ronald D., M-1
Suazo, Gilbert, MP-8
Sullivan, J. Al, AP-1
Sutphin, Howard D., J-11
Swansen, James E., R-1
Tabor, James E., J-15
Talley, Thurman L., TD-1
Tallman, Charles R., AP-1
Thiessen, Henry A., MP-10
Thomas, Gayle J., T-13
Thompson, Jack D., J-8
Trimmer, Manton D., SD-DO
Tubb, George E., MP-11
Ungnade, Paulina V., MP-DO
Van Hecke, J. F., Jr., PER-3
Van Marter, John B., WX-1
Velarde, Peter, WX-3
Vidrine, Marvin P., ENG-1
Vigil, Dimas G., SP-1
Visel, Mildred G., ISD-6
Voelz, George L., H-DO
Wachocki, Eugenia M., G-1
Walker, Donald, MP-1
Walton, Roddy B., R-1
Warren, Mary G., P-1
Welch, Betty S., E-1
Wellnitz, Robert A., ISD-7
West, Jimmie L., WX-1
Wheeler, Hooper E., ENG-1
Williams, Evila E., GMB-AP
Williams, Ray E., Q-12
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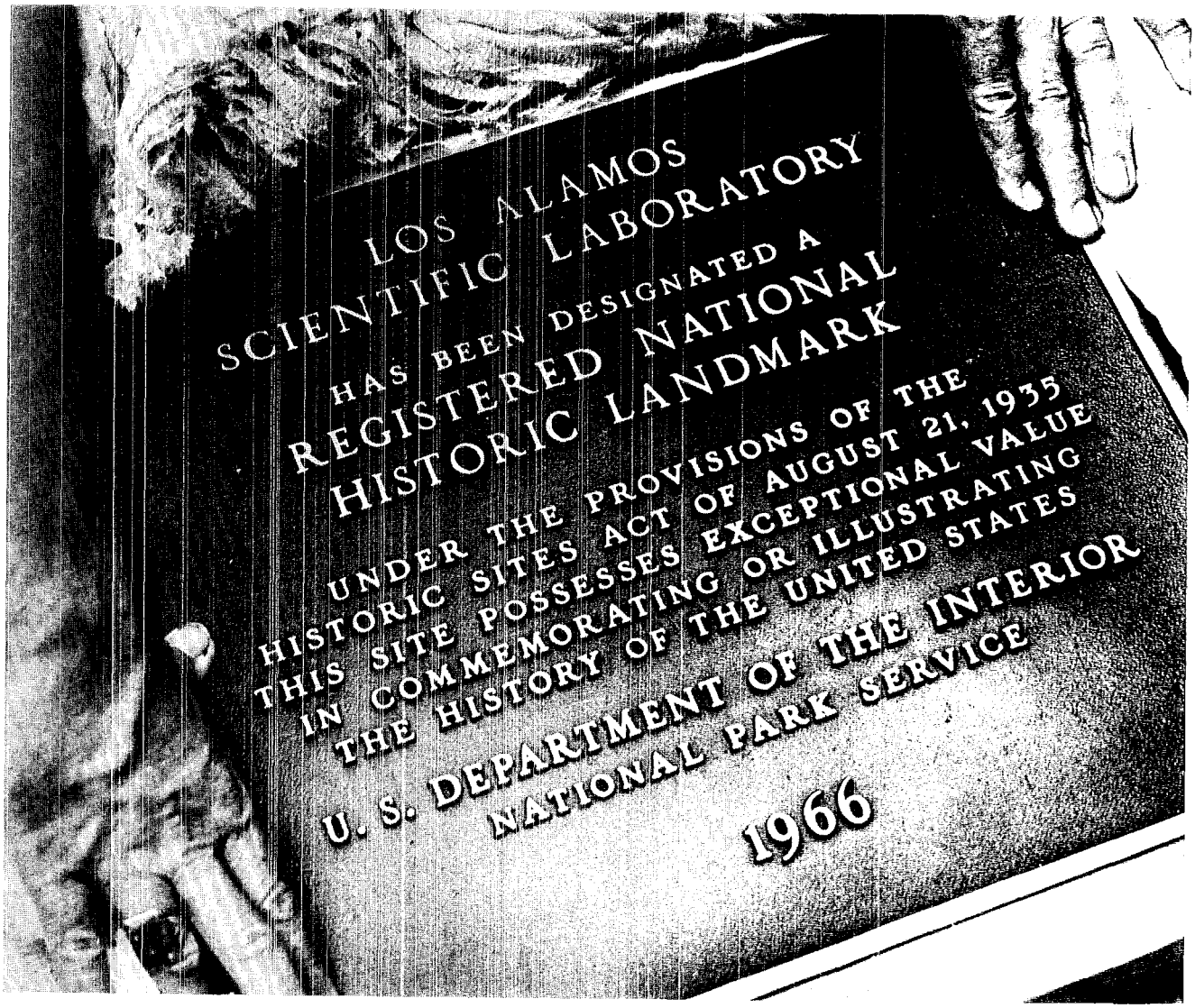
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